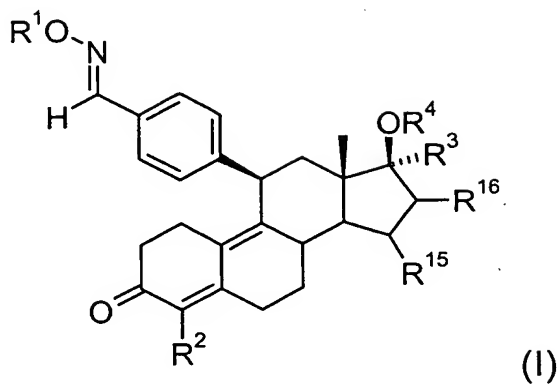


Claims

1. Compounds of general formula I



in which radicals R^1 , R^2 , R^3 , R^4 and R^5 as well as R^{15} and R^{16} have the following meaning:

R^1 is a hydrogen atom, an alkanoyl radical with 1 to 10 carbon atoms or an optionally substituted benzoyl radical with 6-10 carbon atoms or a radical $CONHR^5$, whereby R^5 is a hydrogen atom, an alkyl or acyl radical with 1-10 carbon atoms in each case or an alkylaryl or aralkyl radical with 6-10 carbon atoms in each case,

R^2 is a hydrogen atom, a halogen atom or a CF_3 group,

R^3 is a hydrogen atom or a group CH_2X , in which X stands for a hydrogen

atom, a hydroxy group, a halogen atom, an alkyl radical with 1 or 2 carbon atoms, or X stands for a radical $(\text{CH}_2)_n\text{CH}_2\text{Y}$ with $n = 0$ or 1 , and Y stands for a halogen atom,

whereby if

R^2 is a halogen atom, R^3 in addition can mean a group $\text{C}_n\text{F}_m\text{H}_o$, whereby $n = 1, 2, 3, 4$ or 5 , $m > 1$ and $m + o = n + 1$,

R^4 means a hydrogen atom, an alkyl or alkanoyl radical that consists of 1-10 carbon atoms in each case or a benzoyl radical with 6-10 carbon atoms or a radical $-\text{CONHR}^5$, whereby R^5 has the above-indicated meaning,

R^{15} and R^{16} represent hydrogen atoms or together a double bond,

whereby 4-[17 α -chloromethyl-17 β -hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime and 4-[17 α -chloromethyl-17 β -methoxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime are excluded.

2. Compounds of general formula 1 according to claim 1, in which R^2 is a chlorine or bromine atom.

3. Compounds of general formula I according to claim 1, in which R^3 is a hydrogen atom or a group CH_2X ,

in which X can be a hydrogen atom, a hydroxy group, a halogen atom, a straight-chain or branched or unsaturated alkyl radical with 1-4 carbon atoms, a radical $(\text{CH}_2)_n\text{CH}_2\text{Y}$ with $n = 0$ or 1 , and Y can be a halogen atom,

and X and/or Y can be fluorine, chlorine or bromine.

4. Compounds of general formula I, characterized in that R^4 is a hydrogen atom or an alkyl radical with 1 to 4 carbon atoms.
5. Compounds of general formula I according to claim 1, in which R^1 means a hydrogen atom, R^2 stands for a hydrogen atom, a chlorine atom or a bromine atom, and R^3 can be a hydrogen atom, a methyl group, or a CH_2-X group, whereby X stands for a fluorine, chlorine or bromine atom or a hydroxy group.
6. Compounds of general formula I, namely:
 - 4-[4'-Bromo-17 β -hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,
 - 4-[4'-Bromo-17 β -hydroxy-17 α -methyl-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,
 - 4-[4'-Bromo-17 β -hydroxy-17 α -trifluoromethyl-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,
 - 4-[17 α -Bromomethyl-17 β -hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,
 - 4-[17 β -Hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,
 - 4-[17 β -Acetoxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,
 - 4-[17 β -Acetoxy-4'-bromo-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,
 - 4-[17 β -Acetoxy-4'-bromo-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-O-acetyloxime,
 - 4-[17 β -Benzoyloxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[17 β -(N-Ethylamino)carbonyloxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[17 β -Hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-[N-(ethylamino)carbonyl]oxime,

4-[17 β -Methoxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-[N-(ethylamino)carbonyl]oxime,

4-[17 β -Methoxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[4'-Bromo-17 β -methoxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[17 β -Hydroxy-3-oxoestra-4,9,15-trien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[17 β -Methoxy-3-oxoestra-4,9,15-trien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[17 β -Hydroxy-17 α -methyl-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[4'-Chloro-17 β -hydroxy-17 α -trifluoromethyl-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[4'-Chloro-17 β -hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[17 α -Fluoromethyl-17 β -hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[4'-Bromo-17 α -fluoromethyl-17 β -hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[4'-Bromo-17 α -chloromethyl-17 β -hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[4'-Bromo-17 α -bromomethyl-17 β -hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[4'-Chloro-17 β -methoxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[4'-Chloro-17 α -chloromethyl-17 β -hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[17 β -Ethoxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[17 β -Isopropoxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[17 β -Benzyloxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[17 β -Methoxy-4'-trifluoromethyl-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[4'-Chloro-17 β -hydroxy-17 α -methyl-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime,

4-[17 β -Hydroxy-17 α -methyl-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-[O-(ethylamino)carbonyl]oxime,

4-[17 β -Hydroxy-17 α -hydroxymethyl-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-[O-(ethylamino)-carbonyl]oxime.

7. Pharmaceutical preparations that contain at least one compound of general formula I according to claim 1 as well as a pharmaceutically compatible vehicle.
8. Use of the compounds of general formula I according to one of claims 1 to 6 for the production of pharmaceutical agents for female birth control.

9. Use of the compounds of general formula I according to one of claims 1 to 6 for the production of pharmaceutical agents for treating dysfunctional bleeding.
10. Use of the compounds of general formula I according to one of claims 1 to 6 for the production of pharmaceutical agents for treating a dysmenorrhea.
11. Use of the compounds of general formula I according to one of claims 1 to 6 for the production of pharmaceutical agents for inducing an amenorrhea.
12. Use of the compounds of general formula I according to one of claims 1 to 6 for the production of pharmaceutical agents for treating hormonal disorders in postmenopausal women.
13. Use of the compounds of general formula I according to one of claims 1 to 6 for the production of pharmaceutical agents for treating endometriosis as well as uterus myomatoses, whereby 4-[17 α -chloromethyl-17 β -hydroxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime and 4-[17 α -chloromethyl-17 β -methoxy-3-oxoestra-4,9-dien-11 β -yl]benzaldehyde-1-(E)-oxime are excluded.
14. Use according to one of claims 8 to 10 in combination with at least one low-dose natural or synthetic estrogen or prodrugs thereof.
15. Use according to claim 11, wherein the estrogen is used as 3-sulfamate.
16. Use according to claim 12, wherein the estrogen-3-sulfamate is 17 β -hydroxy-estra-1,3,5(10)-trien-3-yl-sulfamate.